



Which ECIDS System Model is Best for our State ECIDS?

An Early Childhood Integrated Data System (ECIDS) collects, integrates, maintains, stores, and reports information from early childhood programs across multiple agencies within a state that serve children and families from birth to age eight. The state's early childhood leadership team should define the mission and drive the specific purpose(s) of the ECIDS in support of the state's goals and to meet the information needs of their intended users. As states get to the point where they need to start to translate their mission or vision statement into system requirements, the following key considerations for each model should be carefully considered.

Given the complexity and changing nature of the early childhood sector, the ECIDS system design must be flexible enough to cross and expand into additional domains, but fixed enough to achieve stakeholder requirements. This is especially true if a state's ECIDS will be connecting with, or is a component of, the state's P-20W statewide longitudinal data system (SLDS). Even if a state's current plans do not factor a linkage to the state's longitudinal programs, the state's ECIDS team should take some time to consider the implications of how the data will be stored and for how long.

When starting this conversation in your state, best practice shows it is more successful when the appropriate context is provided around the data system conversation. This means that the purpose and vision for creating the ECIDS is clear, the intended use of the data and the expectations in terms of reporting and format have been discussed, and the appropriate governance surrounding the technical decisions is in place. Throughout this document there are other helpful tips for having a successful ECIDS data system conversation in your state.

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Tip: A key step to ensuring success in an ECIDS is to create or obtain a data dictionary from every data source to develop a data inventory prior to designing the system.



Centralized Model

Under a centralized data system model, early childhood data from across all participating programs and agencies is generally consolidated into one database or data warehouse. This generally involves a process of extracting data from the various source systems; matching the data to establish linkages with existing data; transforming it into a singular, cross system representation; and loading it into a database structure designed for overall early childhood program usage. With the data loaded into the central database, it can then be used for data extracts, aggregate data reporting, populating dashboards, and/or research and analysis. Once the data are integrated into a centralized ECIDS, the state can then feed appropriate data into the P-20W SLDS, if needed.

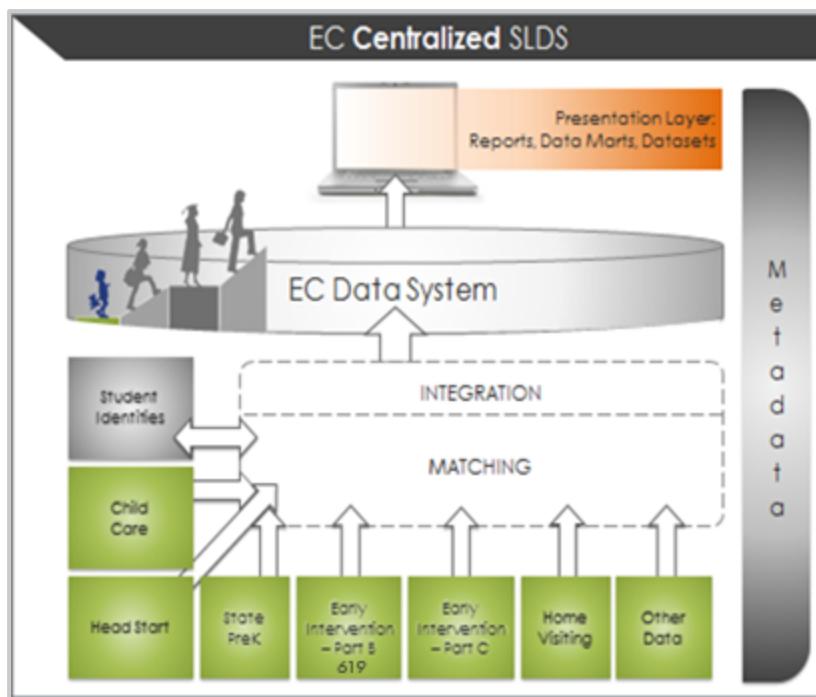


Figure 1: Centralized Model for an Early Childhood Data System

Strengths of a centralized model:

- Queries and reports can be run easily and in a timely manner.
- Producing datasets for partnering agencies has less of an impact on staff workload.
- The system produces consistent data.
- There is a wider range of short-term and long-term report categories and analyses possible.
- The data are matched once and can be reused many times.

Weaknesses of a centralized model:

- The consolidated database requires extensive support, including a database administrator, storage, server, etc.
- There may be public concern about so much child-level data and personally identifiable information being stored in one place or misused

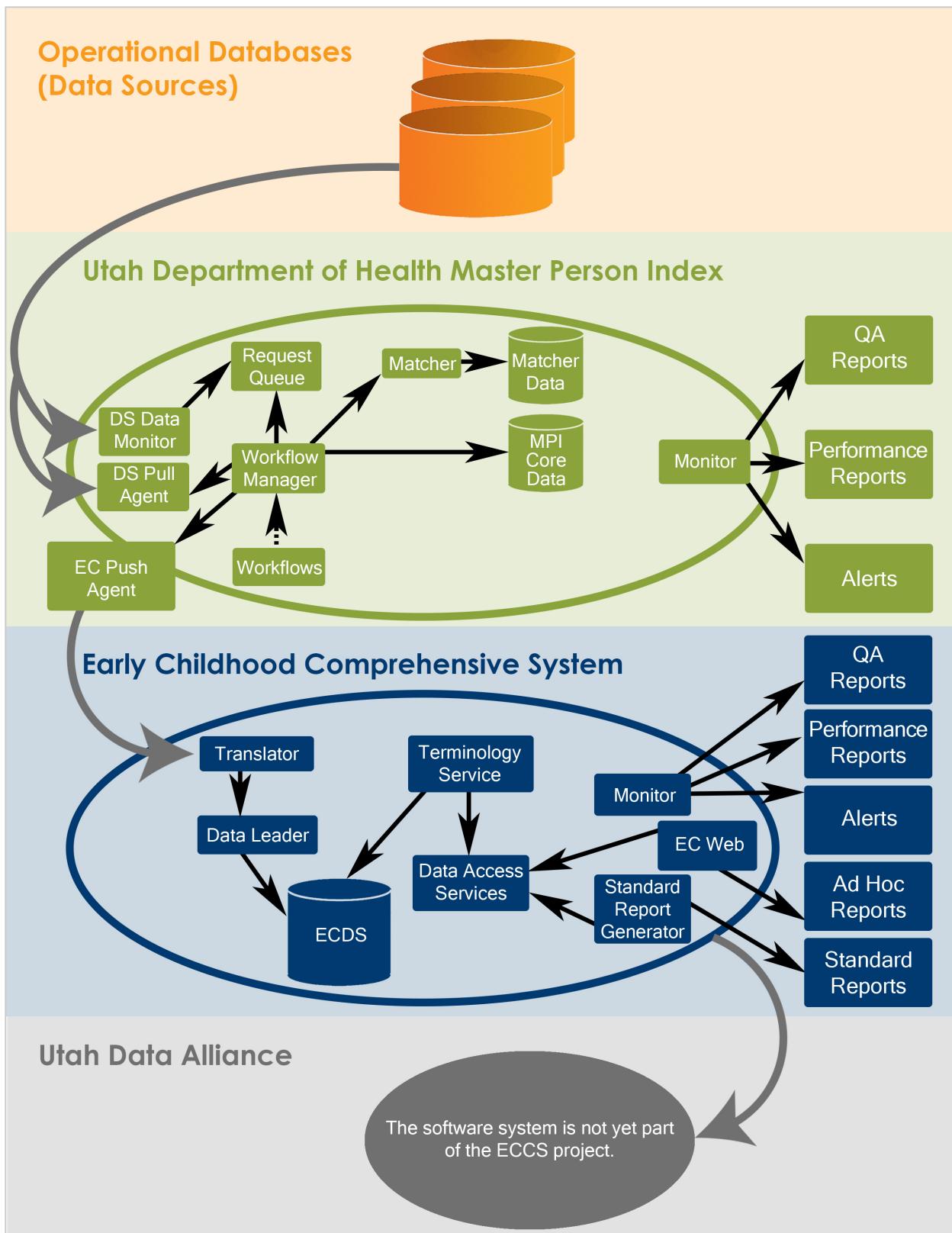


Figure 2: Example of a Centralized ECIDS: State of Utah



Federated Model

In a federated data system model, early childhood data generally are not consolidated from across all participating programs and agencies; rather, each program or agency feeds appropriate data into the ECIDS—and potentially the P-20W SLDS—directly from its own data sources. Linkages used to produce matched data files from different sources do not persist under a federated model. This process generally entails the extraction of data from the various source systems, creating a linkage with data from other sources, and generating a dataset that can be used for research or data analysis. This process must be done each time a dataset needs to be generated.

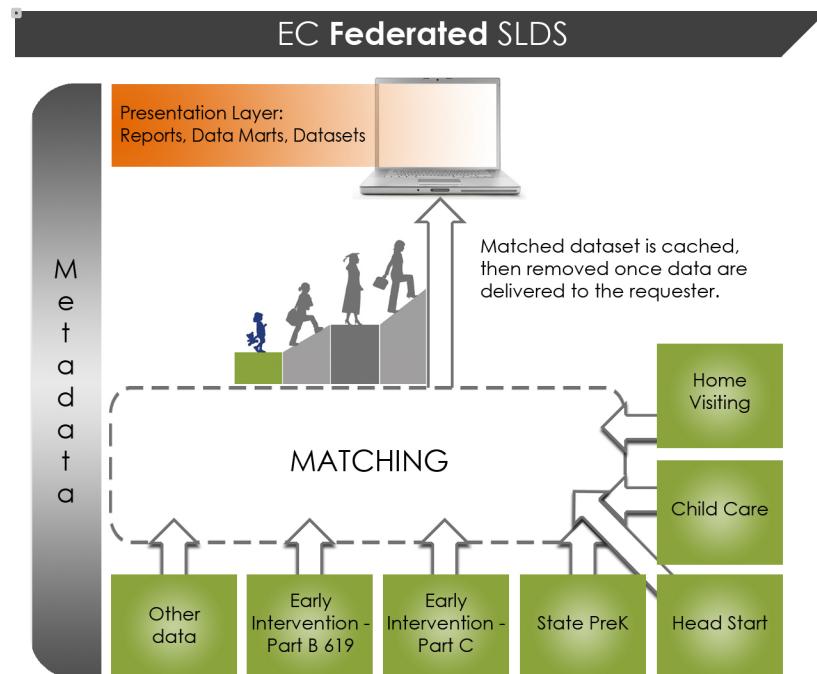
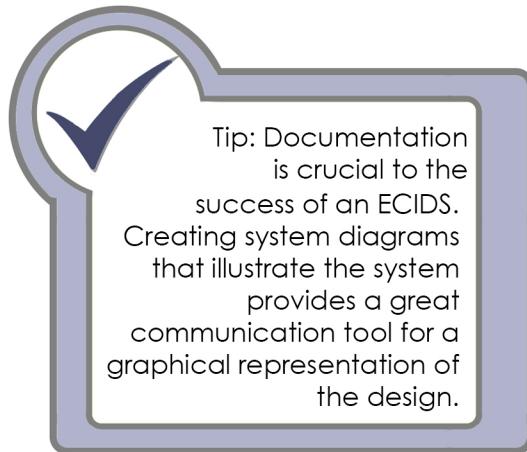


Figure 3: Federated Model for an Early Childhood Data System

Strengths of a federated model:

- There is no costly, centralized database to support.
 - There are fewer resources are needed.
 - There are fewer concerns about storing so much child-level data in a central location.



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Weaknesses of a federated model:

- Determining longitudinal cohorts across data systems can be a challenge.
- The system can only produce data files—long-term and stored datasets are not available.
- The process of gathering data across multiple agencies' requests results in a longer production period for a data file.
- The system is unable to produce reports with persistent data linkages.
- Longitudinal datasets are limited to the depth of the data stored in the source system (e.g., the Head Start program's database may only maintain the current year of data, limiting the ability to define a longitudinal study).

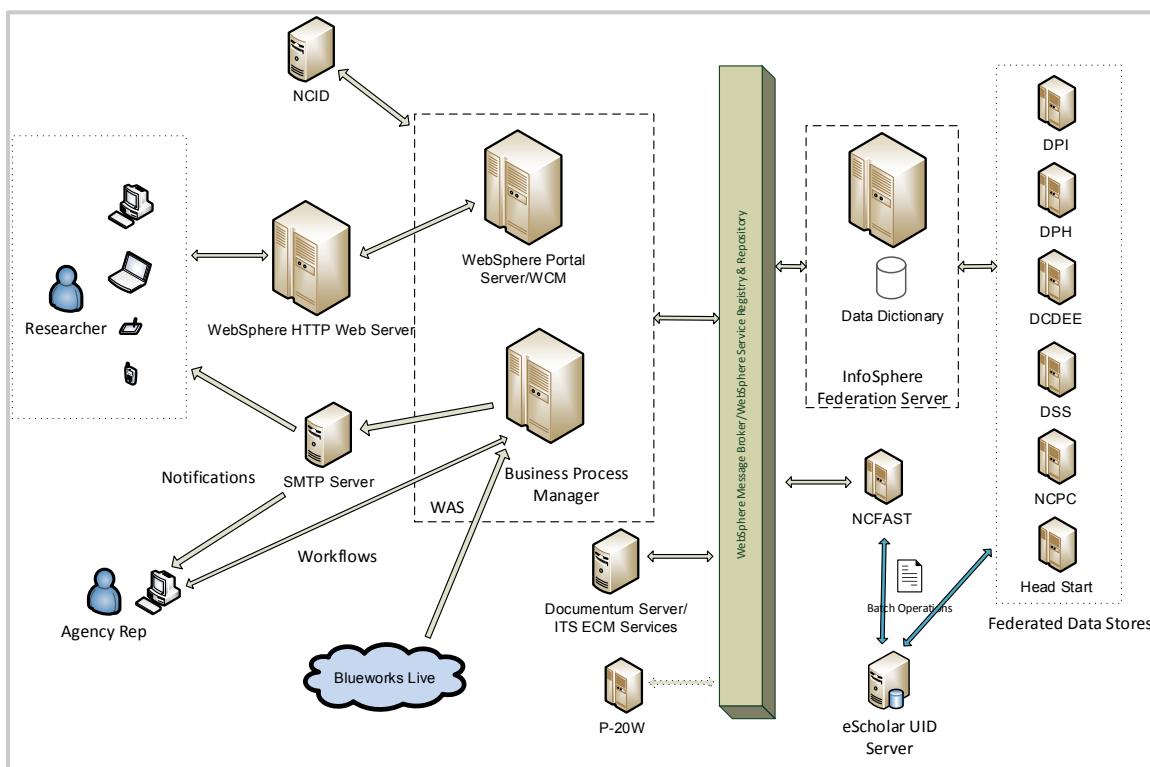


Figure 4: Example of a Federated ECIDS: State of North Carolina



Hybrid Model

In a hybrid data system model, early childhood data are generally not consolidated from across all participating programs and agencies. As in a federated model, each program or agency feeds appropriate data into the ECIDS or potentially into the P-20W SLDS directly from its own data source. The key difference from a federated model is that matched linkages persist in a hybrid model.

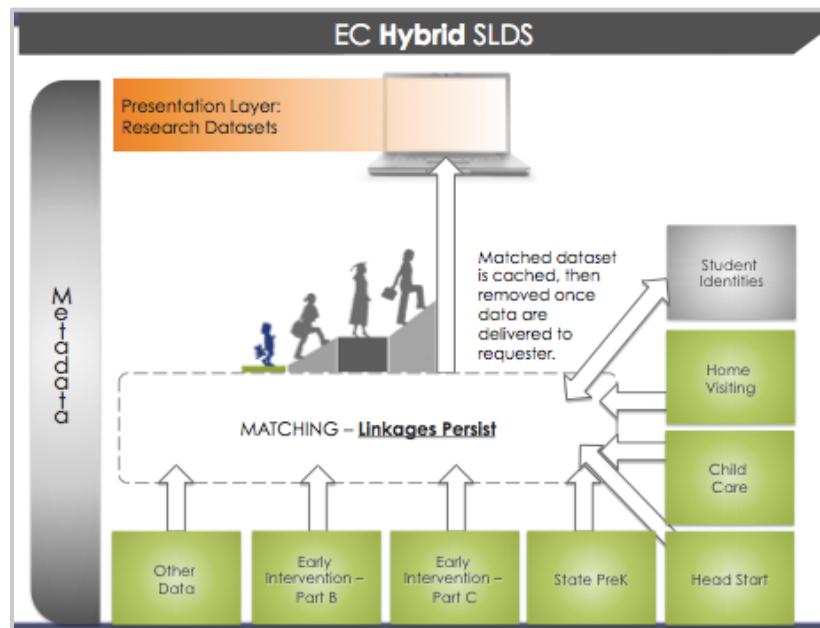


Figure 5: Hybrid Model for an Early Childhood Data System

Strengths of a hybrid model:

- The data matching process is done only once.
- There are persisting linkages, which reduces processing time.
- There is no need for a large central database, and limited support is needed for the match database.

The primary weakness of a hybrid model is that it faces similar reporting and cohort-defining challenges as a federated model.



Conclusion

In summary, when deciding on which model to adopt, states should consider the following:

- a. Have privacy and security concerns been addressed?
- b. Is there a comprehensive data inventory to prioritize which data elements will be included in the ECIDS?
- c. Have requirements been developed based on data governance-established policies and procedures?
- d. Has in-house existing infrastructure been leveraged? Have other available short-term and long-term resources been identified?
- e. Have the long-term data requirements for longitudinal systems been considered?
- f. Has it been ensured that the data produced from the system align with the needs identified by the state?
- g. Have staff resources available in both the short-term and the long-term been considered?

Additional Resources

Answering Key Questions with an Early Childhood Data System

<https://slds.grads360.org/#communities/pdc/documents/4798>

Early Childhood Data Governance in Action: An Introduction

<https://slds.grads360.org/#communities/pdc/documents/4533>

Early Childhood Data Governance in Action! Initial Steps to Establish Data Governance

<https://slds.grads360.org/#communities/pdc/documents/4565>

Planning for a Sustainable ECIDS

<https://slds.grads360.org/#communities/pdc/documents/5184>

System Design Component of the ECIDS Toolkit

<https://slds.grads360.org/#program/ecids-toolkit:-system-design>

SLDS Early Childhood Integrated Data System Self-Assessment – Component E: System Design

<https://slds.grads360.org/api/ApplicationMedia/GetDownload/23112>

What is an Early Childhood Integrated Data System?

<https://slds.grads360.org/#communities/pdc/documents/4441>